

## **ECE 4413/6413 — Digital Signal Processing**

Textbook: Sophocles J. Orfanidis, *Introduction to Signal Processing*, Prentice Hall, 1996.  
(ISBN: 0-13-209172-0)

1. Sampling
  - Sampling theorem
  - Sampling of sinusoids
  - Spectra of sampled signals
  - Reconstruction
2. Quantization
  - Quantization process
  - D/A converters
  - A/D converters
3. Discrete-time Systems
  - Discrete-time system properties
4. FIR Filtering and Convolution
  - Block processing methods
  - Sample processing methods
5.  $z$  transform
  - $z$  transform properties
6. Transfer Functions
  - Transfer function properties
  - Pole/zero designs
7. Digital Filter Realizations
  - Direct form
  - Canonical form
  - Cascade form
8. DFT/FFT Algorithms
  - DTFT
  - DFT and its matrix form
  - Inverse DFT
  - FFT
  - Fast convolution
9. FIR Digital Filter Design
  - Window method
  - Kaiser window
  - Frequency sampling method